Prime Conduit™ Multi-Gard® Multi-Cell Raceway

PVC

Fiberglass

Galvanized Steel

PVC-Coated Galvanized Steel

EMT – Electrical Metallic Tubing

Prime Conduit™ Multi-Gard PVC

RUS Accepted

Multi-Gard PVC is a multi-cell raceway system specifically designed for use in direct bury and concrete encased applications. Multi-Gard PVC is available in Type C, Type 40 and Type 80 outer shells with 3-way or 4-way innerduct configurations. Multi-Gard PVC is manufactured in convenient 20ft. lengths for easy handling and transportation, and is ideal for jetting or pulling cable.

Applications: **Outdoor Direct Bury and Concrete Encasement**

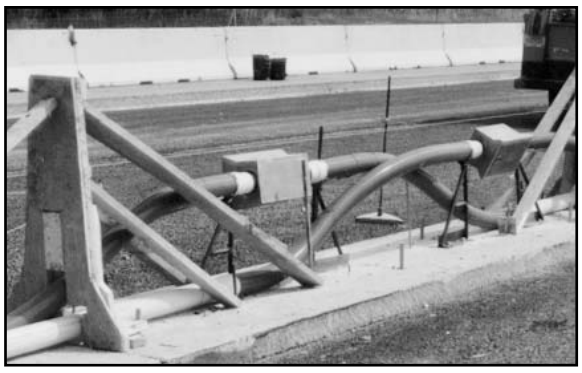
Wall Types: **Type C, Type 40 and Type 80**

Innerducts: **3-Way 1 1/2" or 4-Way 1 1/4"**

Installation Method: **Trenching, Plowing, Concrete Encased**
NOTE: Always install Bell End onto Spigot End

Features

- Pre-lubricated innerducts provide very low coefficient of friction for easy pulls, and PVC innerducts expand and contract at the same rate as outerduct.
- Anti-reversing gaskets on coupling body allow for easy joining. Eliminates need for cementing joints.
- Jettable using high speed air blowing systems.
- O-ring gasket at base of bell reduces risk of water entering system.
- Inward tapering holes on coupling body give quick and easy innerduct alignment.
- Print line on outer duct states "Install Print Line Up" to keep system straight during installation.
- Marked innerduct and marked hole on coupling body ensure proper innerduct alignment and allow crews to work from opposite directions.
- 6" deep bell provides strong joint for field bends.
- Internal spacers maintain straight innerduct path.
- End caps are provided on each 20 ft. section.
- Staging materials to job site is simplified.
- Patented flexible bends allow changes in direction.



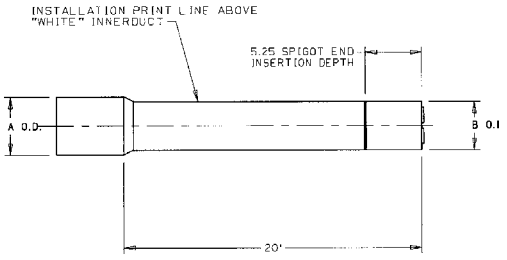
Technical Information

- Joint Tensile: Approx. 500 lbs. (for reference only)
- 3,500 ft. maximum for Jetting

UL LISTED
E153557
Except where noted by ▶

20' Lay Length PVC Multi-Cell With Bell

Part No.	Description	Bell (A)	Outerduct (B)	Innerduct O.D.	Innerduct I.D.	Pkg. Qty.	Wt. per 100 ft.
MXSS4S-020	4-Way Type C	4.67	4.35	1.31	1.19	1060'	245
MXSS3S-020	3-Way Type C	4.67	4.35	1.66	1.50	1060'	256
MFSS4S-020	4-Way Type 40	5.00	4.50	1.31	1.19	960'	338
MFSS3S-020	3-Way Type 40	5.00	4.50	1.66	1.50	960'	348
▶ MDSS4S-020	4-Way Type 80	5.50	4.75	1.31	1.19	760'	450
▶ MDSS3S-020	3-Way Type 80	5.50	4.75	1.66	1.50	760'	460



Standard Multi-Gard supplied with grey and one white tracer innerduct.

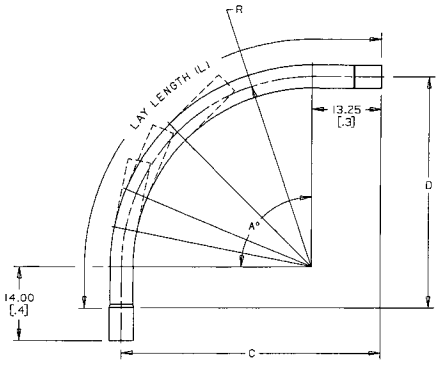
Custom Orders:
* Custom innerduct colors available upon request
* Minimum order quantity required
* Custom orders non-returnable, non-refundable and non-cancelable

PVC Multi-Cell Fixed Bends With Bell

Multi-Gard fixed bends use the same coupling design as straight sections. All bends are provided with engineered plastic innerducts to avoid rope burn-through. These fixed bends are jettable.

Part No.	Description	Innerduct I.D.	Pkg. Qty.
M___N4S	4-Way Fixed Bend	1.19	1
M___N3S	3-Way Fixed Bend	1.50	1

Pos. 1 Product	Pos. 2 Outerduct	Pos. 3 Degree(A)	Pos. 4 Radius(R)	Pos. 5 O.D.	Pos. 6 Innerducts	Pos. 7 Innerduct Wall Type
M = Multi-Cell	X = Type C F = Type 40 D = Type 80	3 = 11 1/4 5 = 22 1/2 7 = 45° 9 = 90°	F = 3ft. H = 4ft. J = 6ft. M = 9ft.	N = 4"	4 = 4-Way 3 = 3-Way	S = Smooth



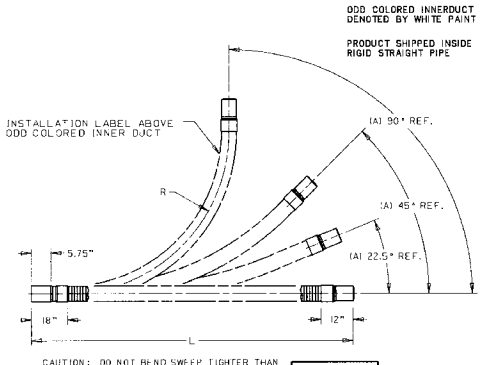
PART NUMBER	DIMENSIONS – INCHES (METERS) A	R	C	D	L
M_3FN_S	11.25°	36 (0.91)	3.28 (0.08)	27.90 (0.71)	2'4" (0.71)
M_5FN_S	22.5°		7.81 (0.20)	33.90 (0.86)	3'0" (0.91)
M_7FN_S	45°		19.91 (0.51)	42.70 (1.08)	4'2" (1.27)
M_9FN_S	90°		49.25 (1.25)	43.88 (1.11)	5'6" (1.58)
M_3HN_S	11.25°	48 (1.22)	3.51 (0.09)	30.24 (0.77)	2'7" (0.79)
M_5HN_S	22.5°		8.72 (0.22)	38.49 (0.98)	3'4" (1.02)
M_7HN_S	45°		23.43 (0.60)	51.19 (1.30)	4'11" (1.50)
M_9HN_S	90°		61.25 (1.56)	55.88 (1.42)	8'1" (2.46)
M_3JN_S	11.25°	72 (1.83)	3.97 (0.10)	34.92 (0.89)	3'0" (0.91)
M_5JN_S	22.5°		10.55 (0.27)	47.67 (1.21)	4'2" (1.27)
M_7JN_S	45°		30.46 (0.77)	68.16 (1.73)	6'6" (1.98)
M_9JN_S	90°		85.25 (2.17)	79.88 (2.03)	11'3" (3.43)
M_3MN_S	11.25°	108 (2.74)	4.66 (0.12)	41.94 (1.07)	3'7" (1.09)
M_5MN_S	22.5°		13.29 (0.34)	61.45 (1.56)	5'4" (1.63)
M_7MN_S	45°		41.00 (1.04)	93.62 (2.38)	8'10" (2.69)
M_9MN_S	90°		121.25 (3.08)	115.88 (2.941)	15'11" (4.85)

PVC Multi-Cell Flexible Bends With Bell

Multi-Gard flexible bends use a patented design capable of a 4' minimum bend radius and use the same coupling design as straight sections and fixed bends. All bends are provided with an exclusive, patented engineered plastic innerducts to avoid rope burn-through. NOTE: After positioning the bend in its application, it is necessary to cut off the excess innerduct material flush to pipe and deburr both the I.D. and O.D. of the innerduct to remove snags.

Part No.	Description	Innerduct I.D.	Pkg. Qty.
M_F_4	4-Way Flexible Bend	1.19	1
M_F_3	3-Way Flexible Bend	1.50	1
M_F_4J	4-Way Flexible Bend	1.19	1
M_F_3J	3-Way Flexible Bend	1.50	1

Pos. 1 Product	Pos. 2 Outerduct Bell	Pos. 3 Description	Pos. 4 Degree and Radius	Pos. 5 Innerducts	Pos. 6
M = Multi-Cell	X = Type C F = Type 40 D = Type 80	F = Flexible	B = 126" (Length) 4' x 90° C = 192" (Length) 6' x 90°	4 = 4-Way 3 = 3-Way	J = Jettable



CAUTION: DO NOT BEND SWEEP TIGHTER THAN SPECIFIED IN CHART.

PART NUMBER	R	A	OVERALL LAY LENGTH (IN) L
M_FB_	4 FT	0-90°	126
	6 FT	0-70°	
	9 FT	0-55°	
M_FC	6 FT	0-90°	192
	9 FT	0-90°	

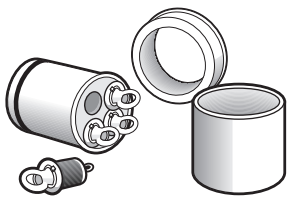
Terminators

Termination kits allow for sealing inner and outerducts. Each kit contains innerduct sealing plugs with rope tie. Standard terminators allow for end terminations, and pass-through (jet-through) terminators allow for bridging innerducts across a vault to allow for unassisted pulling (or jetting) of cable through the vault. Box terminators allow end terminations into above ground cabinets.

Part No.	Description	Pkg. Qty.
M_T__	Terminator	1

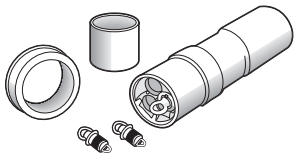
Pos. 1 Product	Pos. 2 Outerduct	Pos. 3 Description	Pos. 4 Type	Pos. 5 Innerducts
M = Multi-Cell	X = Type C F = Type 40 D = Type 80	T = Terminator	1 = Standard w/ plugs 2 = Pass-through w/ plugs 6 = Enclosure Termin. w/ plugs 9 = Jetting Termin. w/ plugs	3 = 3-Way 4 = 4-Way

Standard



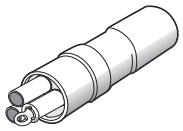
M_T14

Pass-through



M_T23

Jet-through



M_T93

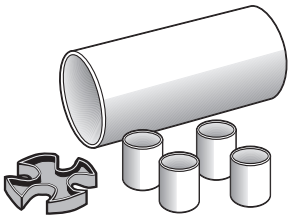
Couplings

Couplings are provided in standard sleeve for joining two uninstalled plain ends and slip couplings for male/male connections and repair of unoccupied Multi-Gard.

Part No.	Description	Pkg. Qty.
M_CC_	Standard Sleeve Coupling	1
M_SC_	Slip Coupling	1

Pos. 1 Product	Pos. 2 Outerduct	Pos. 3 Description	Pos. 4 Type	Pos. 5 Innerducts
M = Multi-Cell	X = Type C F = Type 40 D = Type 80	C = Standard Coupling S = Slip	C = Coupling	3 = 3-Way 4 = 4-Way

Standard



M_CC4

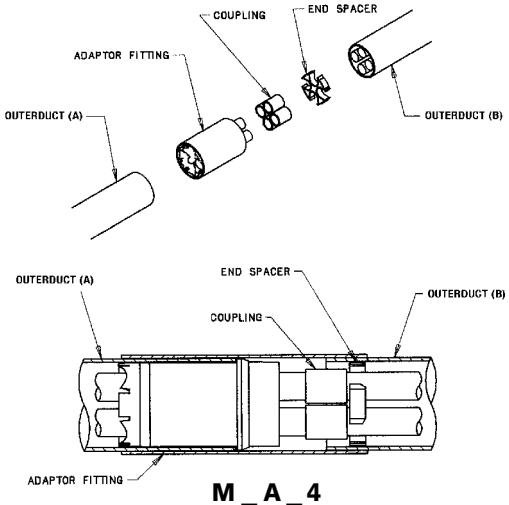
Transition Adapters

- Spigot to Spigot

Transition adaptors allow different outerducts to be coupled together while maintaining same innerduct.
Part numbers configured from smaller duct to larger duct.

Part No.	Description	Pkg. Qty.
M_A__	Transition Adapter	1

Pos. 1 Product	Pos. 2 Outerduct (A)	Pos. 3 Description	Pos. 4 Outerduct (B)	Pos. 5 Innerducts
M = Multi-Cell	X = Type C PVC F = Type 40 PVC D = Type 80 PVC	A = Adapter	E = EMT R = Galv. Steel B = F/G BR H = F/G HW F = Type 40 PVC D = Type 80 PVC X = Type C PVC P = PVC-Coated Steel	3 = 3-Way 4 = 4-Way



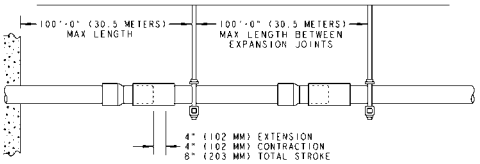
M_A_4

Expansion Joints

Expansion Joints allow for thermal expansion and contraction of outerduct. PVC expansion joints are recommended every 100 feet on bridge crossing applications.

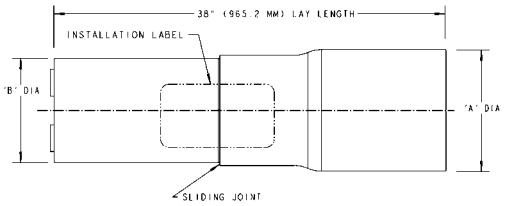
*** Must use Split Stop Rings with Expansion Joints**

* Expansion Joints are not required in underground applications



MATERIAL TYPE	A (IN/MM)	B (IN/MM)
TYPE C	4.67 (118.6)	4.35 (110.5)
TYPE 40	5.00 (127.0)	4.50 (114.3)
TYPE 80	5.54 (140.6)	4.75 (120.6)

Part No.	Description	Pkg. Qty.
M_EC_	Expansion Joint	1

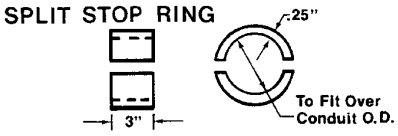


Pos. 1 Product	Pos. 2 Outerduct	Pos. 3 Description	Pos. 4 Type	Pos. 5 Innerducts
M = Multi-Cell	X = Type C PVC F = Type 40 PVC D = Type 80 PVC	E = Expansion Joint	C = Coupling	4 = 4-Way 3 = 3-Way

Split Stop Ring

Use split stop rings on either side of support anchors to keep Multi-Gard stationary.

*** Must use Split Stop Rings with Expansion Joints**

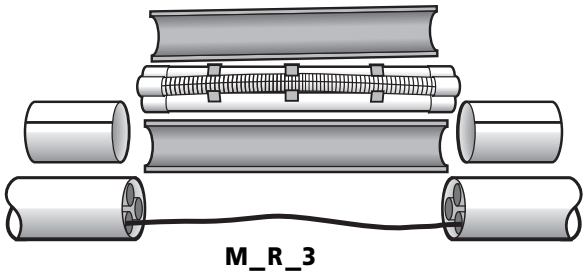


Part No.	Description	Pkg. Qty.	Wt. ea.
MFSSR	Type 40 Split Ring	1	.51
MDSSR	Type 80 Split Ring	1	.73

Repair Kits – 10 Ft.

Repair kits allow for Multi-Gard repair without disrupting a live cable.

Part No.	Description	Pkg. Qty.
M_R_4S	4-Way 10 ft. Repair - Cable installed	1
M_R_3S	3-Way 10 ft. Repair - Cable installed	1



M_R_3

Pos. 1 Product	Pos. 2 Outerduct	Pos. 3 Description	Pos. 4 No. of Cables	Pos. 5 Innerducts	Pos. 6 Innerduct Wall Type
M = Multi-Cell	X = Type C F = Type 40	R = Repair	1 = 1 Cable 2 = 2 Cables 3 = 3 Cables 4 = 4 Cables	4 = 4-Way 3 = 3-Way	S = Smoothwall

Spare Spacers

Part No.	Description	Std. Ctn. Qty.	Std. Ctn. Wt.
MAES4	4-way end spacers	1 ea. = 5 spacers	3.5
MAES3	3-way end spacers	1 ea. = 5 spacers	.6

Assembly

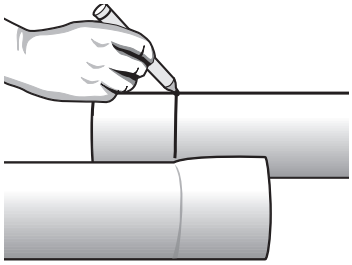
1. Distribute Multi-gard sections along the sides of the trench with male ends pointing towards starting vault entrance.

2. Remove protective cap and install Multi-Gard terminator on male end. Install first section into vault opening or enclosure making sure the print line is on the top stating " INSTALL PRINT LINE UP." (See next page for terminations.)

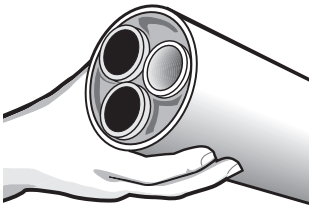
3. Each consecutive 20' section can now be placed by inserting the male end into the gasketed belled end 1/2" to the gasket depth. Make sure the print line is upright. (If not, rotate the outer duct until it is.) Now push the sections together with a firm push until belled end seats against insertion line.

Field Cuts

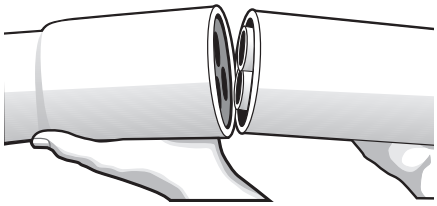
Joining Male and Female Ends



1. Lay the Multi-Gard sections side by side and mark the male end at the base of the bell on the female end. Make a straight cut using a standard carpenter saw.

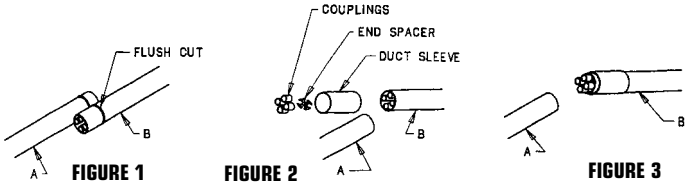


2. A spare spacer may be installed to align the innerducts if they seem loose.

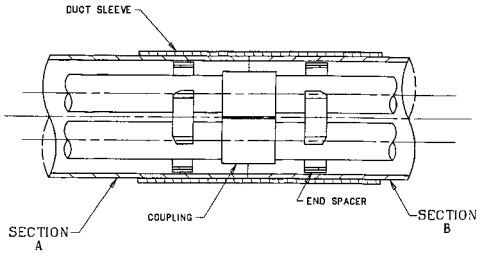


3. Raise both ends and align the innerducts on the male end into the coupling body on the female end. Lower both ends and the innerducts will automatically return to their original position as the joints are forced together.

Joining Two Male Ends



M_CC4

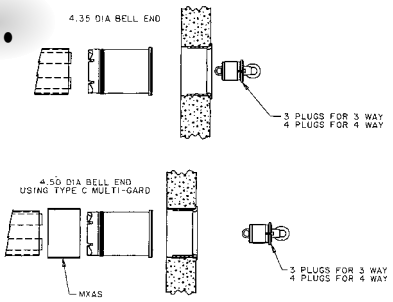


1. Flush cut Multi-Gard sections "A" + "B" as shown in figure 1. Slide outerduct sleeve over Multi-Gard section "B" as shown in figure #2. Insert end spacer into Multi-Gard plain end (chamfer side in) as shown in figure #2. Press couplings onto innerducts of Multi-Gard section "B" as shown in figure #3.

2. Align innerducts on Multi-Gard section "A" with couplings on section "B". Solvent cement each coupling for air tight seal and push until both ends are flush. Apply solvent cement to both ends of Multi-Gard and slide sleeve until it is centered on both sections.

Terminations

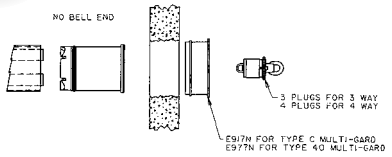
1.



Standard Terminators (Type 1) allow Multi-Gard to be terminated into a standard pre-cast termination.

1. Remove watertight plugs in order to assure total insertion of the Multi-Gard innerducts.
2. Install terminators into male end of Multi-Gard to full depth.
3. Replace watertight plugs into the terminator and tighten.
4. Insert prepared male end into the pre-cast terminator with print line facing upward. Solvent cement into place.
5. Use shim enclosed for terminator requiring a connection of Type C (4.35 O.D.) into a Type 40 (4.50 O.D.) termination.

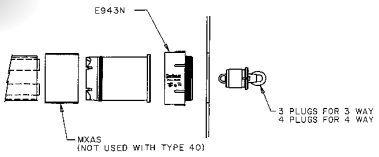
2.



Use a Type 1 Standard Terminator also at an entrance where a pre-cast terminator is not available or a knockout is used:

1. Insert the male end section of Multi-Gard 4 inches past the inside wall of the vault with print line facing upward.
2. Remove the protective cap from the male end of the Multi-Gard.
3. Remove the watertight plugs and insert the terminator to full depth.
4. Install bell fitting over the end of Multi-Gard using solvent cement, and replace plugs.
5. Slide Multi-Gard section until bell fitting is flush with inside, and then seal entrance as required by job specifications.

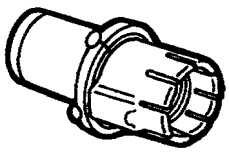
3.



Use a Type 6 Enclosure Terminator at entrances into metal or non-metallic enclosures above ground.

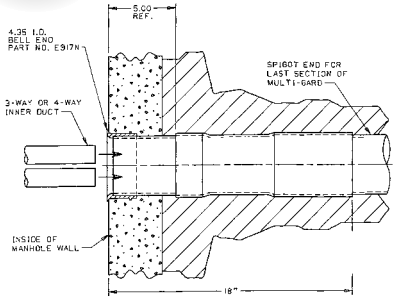
1. Remove watertight plugs in order to assure total insertion of the Multi-Gard innerducts.
2. Install terminators into male end of Multi-Gard to full depth.
3. Replace watertight plugs into the terminator and tighten.
4. Install threaded adapter over end of Multi-Gard using solvent cement. Insert adapter through enclosure hole and provide 4" locking ring.
5. Use shim enclosed for terminator requiring a connection of type C (4.35 O.D.) termination.

4.



Use Simplex split plugs for sealing Multi-Gard cells where cable has been installed.

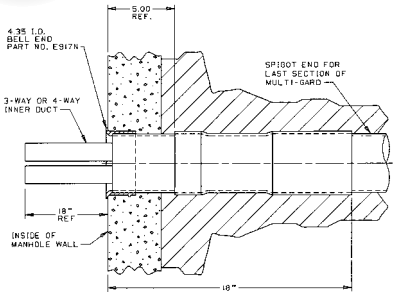
5.



The pass-through terminator is designed to allow for continuous ducts through the vault or hand hole for cable pulling.

1. Install terminator into vault following steps 1 through 5 for standard Type 1 terminator.
2. Cut innerduct of pass through kit 10" longer than the width of the manhole. Add spacers as needed.
3. Upon completion, remove the watertight plugs and install innerducts to traverse manhole/handhole by cutting to length inserting into one side of handhole and raising or bowing center of innerduct span to insert into the pass-through terminator on the opposite side.

6.



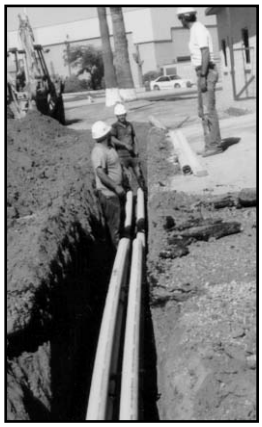
Use the jet terminator for jetting operations.

1. Remove watertight plugs in order to assure to total insertion.
2. Apply standard grade solvent cement (VC9962) to male end of Multi-Gard. Install jet terminator to insertion line.
3. Replace watertight plugs into terminator and tighten.
4. Apply standard grade solvent cement to terminator male end and insert into pre-cast bell end. (Install PVC bell fitting in kit if pre-cast bell end is not available).
5. Use shim enclosed for terminator requiring a connection of Type C (4.35" O.D.) into a Type 40 (4.50" O.D.) termination.
6. Measure between ends of terminators on opposite ends of vault, and cut innerduct to length.
7. Solvent cement each coupling into place or use mechanical coupling rated for use with high speed air blowing systems.

Trenching

All PVC Trenching installation allows Multi-Gard to be placed in the trench one section at a time or over the trencher for continuous feed.

Open trenching with Type C Multi-Gard is recommended for direct burial or concrete encased applications.



Features

- Install one section at a time.
- Multiple-cells are installed as soon as product is placed.
- Economical installation with installation speed as fast as the trencher.
- Easy installation with standard equipment.
- Gasketed coupling body prevents conduit pulling apart during installation.
- Industry standard outer duct in Type C is suitable for direct burial.
- Type 40 outershell and Type 80 outershell are available where extra protection is necessary.
- Spacers inside outershell allow PVC innerduct internal movement allowing for more flexibility.

Procedures

Paved Areas In paved areas, the surface should be carefully cut to prevent unnecessary excessive width at the top of the trench and help reduce the amount of surface to be repaved.

Trench Width For economical operation, particularly where paving is involved, the trench width should be no greater than is needed to provide adequate working space. Generally, this dimension is controlled by the types of excavating equipment used. As a minimum, the trench must be 5 inches wider than the width of the conduit structure where backfill will be used and 3 inches wider where concrete encasement will be used. Individual job specifications will dictate trench width.

Trench Bed Grade and level the trench bed. Where necessary, provide sand and/or other granular backfill as bedding material so the conduit will be evenly supported over the length of each section.

Assembly On Top Of The Trench After preparing the trench, the Multi-Gard can be assembled on top of the ground outside of the trench by following the directions described on page 5. Once joined together, the Multi-Gard can then be laid gently into the trench. Backfill according to the job specifications.

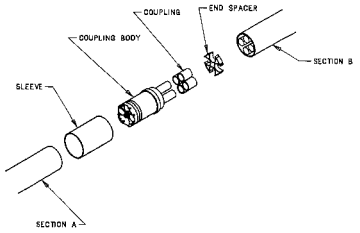
Trench Feeding Multi-Gard Using Rollers This procedure involves assembling the Multi-Gard above the ground. After the first four or five lengths are assembled, place on top of the trenching machine. The remainder of the duct can be attached to the first section and assembled ahead of the trencher on the ground directly above the intended place for the trench. As the trencher advances forward, the Multi-Gard will lay itself into the trench behind. Once placed in the trench, backfill according to the job specification.

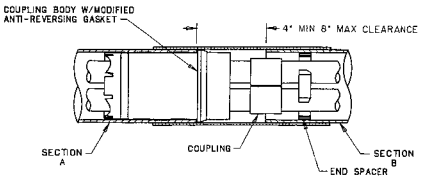
Repairing Vacant Multi-Gard

1. Cut out the damaged section and insert a belled short section (4" shorter than damaged section) of Multi-Gard onto either one of the ends (section A).

2. Apply 2" of cement on ends of spigots of coupling body, press couplings onto spigots.

3. Slide innerduct sleeve over Multi-Gard plain end (section A). Insert end spacer into Multi-Gard plain end (section B).



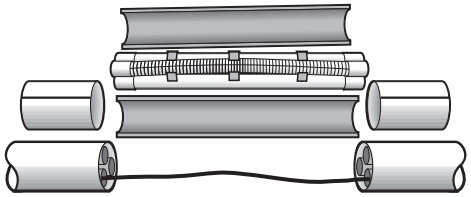


M_SC4 Slip Coupling

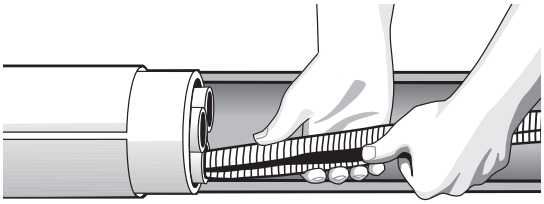
4. Insert female end of slip coupling into Multi-Gard plain end (section A). Align sections A and B. Apply cement to couplings. Slide slip coupling back onto innerducts in Multi-Gard (section B) until seated.

5. Apply cement to both plain ends of Multi-Gard and slide sleeve until centered on both sections.

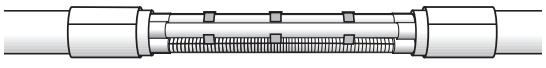
Repairing Multi-Gard Containing Cable(s)



1. Carefully cut out damaged section up to 10 feet. Larger sections can be accommodated using multiple repair kits.



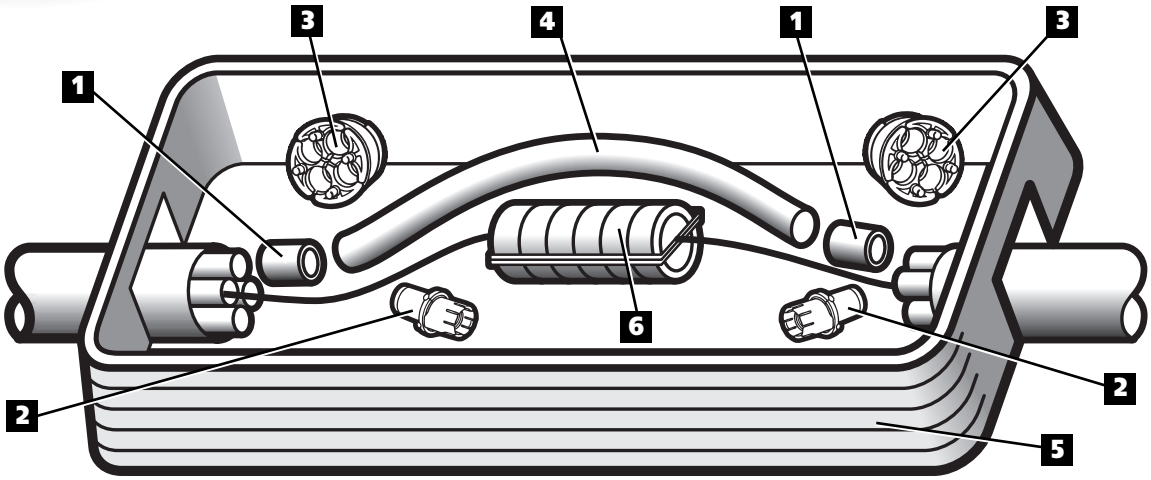
2. Install the 4" split sleeve couplings over the existing Multi-Gard. Slide the smaller split couplings onto the individual innerduct, fitting the cable into the split coupling. Repeat this process on opposite side. Carefully insert the cable(s) into the split corrugated innerduct.



3. Install corrugated innerduct and remaining smooth innerduct into couplings by raising in the center and guiding them into their respective openings. Install the spacers to evenly support the innerduct.

4. Lay one piece of split duct under the repaired section. Install the other piece of split duct onto the first piece and strap or tape in place. Apply cement onto each end and slide the slip sleeves until centered on both sections. Backfill according to job specifications.

Repair Kits



Repairing Multi-Gard with Damaged Cables

1 PVC Coupling
Couples PVC innerduct. Use standard grade sovent cement.

2 MAFPG7PC Fiber Optic Simplex Plug
(cable O.D. range .57 - .65) Seals innerduct with cable installed.

3 Fiber Optic Simplex Quadplex Plug (4 holes each)
Seals outershell and innerduct

4 48808DK PVC Pass-through Kit
(4 x 20' lengths) 20 foot lengths can be cut to length for continuous empty innerduct.

5 Underground Vault & Lid needed
Choose size & construction based on dimensions of splice cases and weight requirements. (Allow 12" on either side of splice for bending innerduct)

6 Splice Case

Repair Kit Instructions:

1. Dig around break area enough to allow vault to drop over the repair area and rest level when the mouseholes have been cut away for the duct.
2. Cut away and remove outer shell and any damaged inner-ducts, being careful to protect any exposed cables.
3. Cut back the outer duct to allow approximately 6" of inner-duct exposed.
4. Install the splice case per manufacturer's or customer's specifications, allowing enough cable slack so no tension is felt.
5. Install the quad plugs (Item #3) and single plugs (Item #2) in duct containing cable.
6. Install pass-through ducts (Item #4) with coupling (Item #1) sealing with solvent cement.
7. Set the enclosure base over the entire package and place cover on enclosure.
8. Refill hole as required.

Prime Conduit™ Multi-Gard® Fiberglass

Multi-Gard is a multi-cell raceway manufactured in 20 ft. lengths with pre-installed, pre-lubricated innerducts. The pre-installed innerduct design feature eliminates the need of pulling innerducts through existing pipe, which saves valuable time and money.

Applications: **Outdoor (UV Resistant) Bridge Crossings, Areas Subject to Physical Damage**

Wall Types: **Heavy or Bullet Resistant**

Innerducts: **PVC 3-Way 1 1/2" or 4-Way 1 1/4"**

Features

- Pre-lubricated PVC innerducts reduce coefficient of friction for easy cable pulling.
- Anti-reversing gaskets on coupling body allow easy push in – hard to pull out sealing system.
- O-ring gasket at base of bell reduces risk of water entering system.
- Inward tapering holes on coupling body give quick and easy innerduct alignment.
- Marked innerduct and marked hole on coupling body ensure proper innerduct alignment.
- Deep bell provides strong joint.
- Internal spacers keep innerducts straight.
- Staging materials to job site is simplified.
- Heavy Wall .090" provides enhanced mechanical protection where physical abuse might be experienced.
- Bullet Resistant .250" provides heavy duty protection.
- Lightweight construction for easy handling.

Assembly Instructions

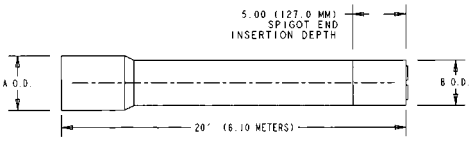
1. Place plain end of one 20' section into gasketed coupling body 1/2" to the gasket depth of another 20' section.
2. Check for alignment and apply epoxy to outside of plain end.
3. Push sections together with a firm push by hand until plain end seats fully into belled end.

Technical Information

- Joint Tensile: Approx. 500 lbs. (for reference only)
- 3,500 ft. Maximum for Jetting
- 20' overall stick length

20' Overall Length Fiberglass Multi-Cell With Bell

Part No.	Description	Wall Thick-ness	Bell (A) Dim.	Outerduct (B) Dim.	Innerduct Dim. O.D.	Innerduct Dim. I.D.	Pkg. Qty.	Wt. per 100 ft. (lbs.)
MHSS4S-020	4-Way Heavy Wall	.090	4.39	4.18	1.31	1.19	1140'	338
MHSS3S-020	3-Way Heavy Wall	.090	4.39	4.18	1.66	1.50	1140'	340
MBSS4S-020	4-Way Bullet Res.	.250	5.00	4.25	1.31	1.19	1140'	450
MBSS3S-020	3-Way Bullet Res.	.250	5.00	4.25	1.66	1.50	1140'	450



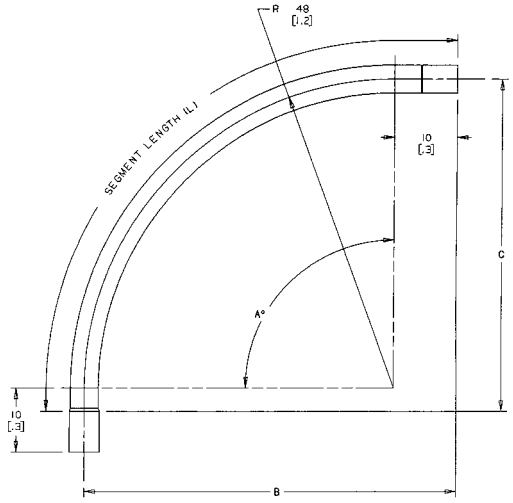
Custom Orders:
* Custom innerduct colors available upon request
* Minimum order quantity required
* Custom orders non-returnable, non-refundable and non-cancelable

Fiberglass Multi-Cell Fixed Bends with Bell

Multi-Gard fixed bends use the same coupling design as straight sections. All bends are provided with engineered plastic innerducts to avoid rope cut-through into adjacent innerducts.

Part No.	Description	Innerduct I.D.	Pkg. Qty.
M__HN4S	4-Way Fixed Bend	1.19 I.D.	1
M__HN3S	3-Way Fixed Bend	1.50 I.D.	1

Pos. 1 Product	Pos. 2 Outerduct	Pos. 3 Degree (A)	Pos. 4 Radius	Pos. 5 O.D.	Pos. 6 Innerducts	Pos. 7 Innerduct Wall Type
M = Multi-Cell	H = Heavy wall B = Bullet Res.	3 = 11 1/4° 5 = 22 1/2° 7 = 45° 9 = 90°	H = 4 ft.	N = 4"	4 = 4-Way 3 = 3-Way	S = Smoothwall



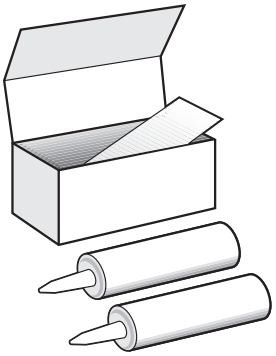
PART NUMBER	ANGLE (A)	SEGMENT LENGTH (L) (INCHES / METERS)	B (IN/M)	C (IN/M)
M__3HN__S	11 1/4	29.4 (.75)	1 (0)	13 (.3)
M__5HN__S	22 1/2	38.8 (.99)	4 (.1)	22 (.6)
M__7HN__S	45	57.7 (1.47)	14 (.4)	38 (1)
M__9HN__S	90	95.4 (2.42)	58 (1.5)	52 (1.3)

Epoxy Kits

Apply epoxy to plain end and bell before insertion for a water tight joint and to avoid joint pull-out.

Part No.	Description	Pkg. Qty.	Wt. ea.
MA30EK	30 oz. w/mixing tip	1	2.50

Pipe Size	# Joints per 30 oz. Kit
2"	30
3"	24
4"	18
5"	12
6"	10



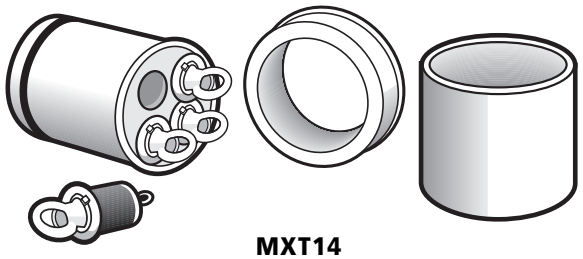
Terminators

Termination kits allow for sealing inner and outerducts. Each kit contains innerduct sealing plugs with tie rope. Standard terminators allow for end terminations.

Part No.	Description	Pkg. Qty.	Wt. Ea
MXT1_	Terminator	1	1.5

Pos. 1 Product	Pos. 2 Outerduct	Pos. 3 Description	Pos. 4 Type	Pos. 5 Innerducts
M = Multi-Cell	X = Standard	T = Terminator	1 = Standard w/ plugs	3 = 3-Way 4 = 4-Way

Standard



MXT14

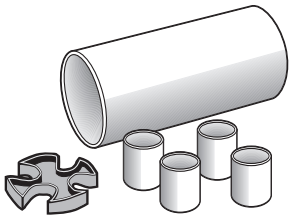
Couplings

Couplings are provided in standard sleeve for joining two uninstalled plain ends and slip couplings for repair of unoccupied Multi-Gard.

Part No.	Description	Pkg. Qty.
M_CC_	Standard Sleeve Coupling	1

Pos. 1 Product	Pos. 2 Outerduct	Pos. 3 Description	Pos. 4 Type	Pos. 5 Innerducts
M = Multi-Cell	H = Hvy. wall .090 B = B. res. .250	C = Standard	C = Coupling	3 = 3-Way 4 = 4-Way

Standard



M_CC4

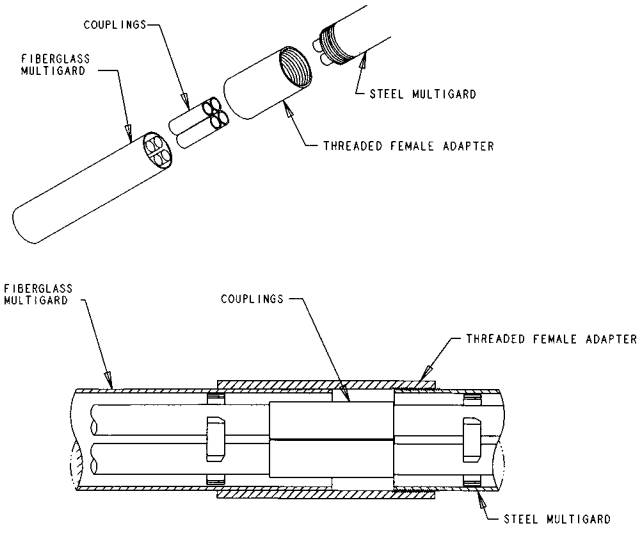
Transition Adapters

• Spigot to Spigot

Transition adapters allow different outerducts to be coupled together while maintaining same innerduct.
(See PVC section for transitioning to PVC Multi-Gard.)

Part No.	Description	Pkg. Qty.
M_A__	Transition Adapters	1

Pos. 1 Product	Pos. 2 Outerduct	Pos. 3 Description	Pos. 4 Outerduct	Pos. 5 Innerducts
M = Multi-Cell	X = Type C PVC F = Type 40 PVC D = Type 80 PVC	A = Adapter	E = EMT R = Galv. Steel B = F/G BR H = F/G HW F = Type 40 PVC D = Type 80 PVC X = Type C PVC P = PVC Coated Steel	3 = 3-Way 4 = 4-Way



M_AR4

Spare Spacers

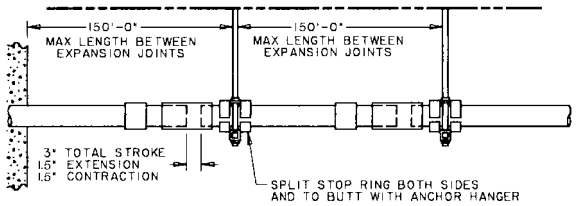
Part No.	Description	Std. Ctn. Qty.	Std. Ctn. Wt.
MAES4	4-way end spacers	1 ea. = 5 spacers	3.5
MAES3	3-way end spacers	1 ea. = 5 spacers	.6

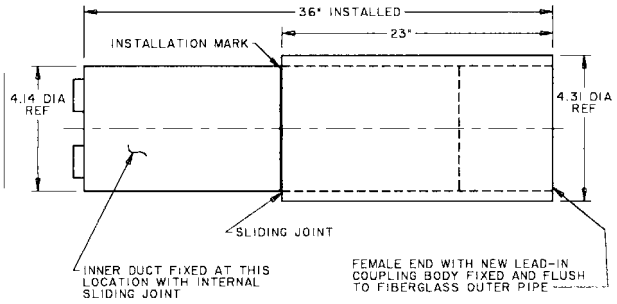
Expansion Joints

Expansion Joints allow for thermal expansion and contraction of outerduct. Fiberglass expansion joints are recommended every 150 feet on bridge crossing applications.

*** Must use Split Stop Rings with Expansion Joints**

* Expansion Joints are not required in underground applications





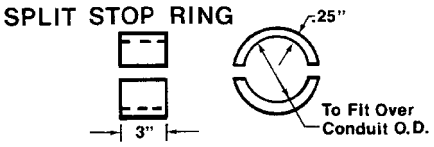
Part No.	Description	Pkg. Qty.
M_EC_	Expansion Joints	1

Pos. 1 Product	Pos. 2 Outerduct	Pos. 3 Description	Pos. 4 Type	Pos. 5 Innerducts
M = Multi-Cell	H = Heavy Wall	E = Expansion	C = Coupling	4 = 4-Way
	B = Bullet Res.			3 = 3-Way

Split Stop Ring

Use split stop rings on either side of support anchors to keep Multi-Gard stationary.

*** Must use Split Stop Rings with Expansion Joints**



Part No.	Description	Pkg. Qty.	Wt. Ea
MSSRH	Heavy Wall Split Ring	1	.50
MBSSR	Bullet Resistant Split Ring	1	1.75

Prime Conduit™ Multi-Gard® Galvanized Steel/PVC-Coated

Steel Multi-Gard is a multi-celled raceway system designed for bridge applications and other areas requiring heavy duty protection. Steel Multi-Gard is manufactured in 10 ft. lengths with pre-installed, pre-lubricated, smoothwall PVC innerducts.

Applications: **Areas subject to physical damage – vandalism & crush. Bridge crossings**

Innerducts: **PVC 3-Way 1 1/2" or 4-Way 1 1/4"**

Features

- Pre-lubricated PVC innerducts for very low co-efficient of friction and lay straight for long pulls.
- Pre-installed reverse spin coupling allows coupling Multi-Gard together without turning pipe.
- 3 set screws keep coupling from backing off, before and after installation.
- Standard sweeps and terminators.
- Patented flexible bend.
- Conforms to NEC Article 300.22 and NFPA 90A for installation of communication cables inside buildings.
- All bends have "cut-through" resistant innerducts in bends to avoid rope cutting into adjacent occupied innerduct.
- Accessories such as pull line and line blowing kits available.
- Gasketed coupling body and PVC innerducts are designed to handle jetting equipment or line blowing.

Technical Information

- Joint Tensile: Approx. 500 lbs. (for reference only)
- 3,500 ft. Maximum for Jetting
- 10 ft. lay lengths standard

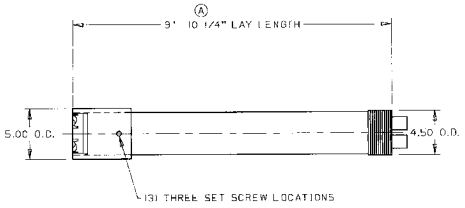
Assembly Instructions

1. Remove cap and loosen set screws on coupling. Spin back to allow for insertion.
2. Insert male into female end and spin coupling forward to bottom out.
3. Check for alignment of marked innerduct and marked hole.
4. Tighten set screws.

10' Lay Length – Steel Multi-Celled with Spin Coupling

Part No.	Description	Coupling O.D.	Outerduct Dim.	Innerduct Dim. O.D.	Innerduct Dim. I.D.	Pkg. Qty.	Wt. per 100 ft.
MRSS4S-010	4-Way Galvanized Steel	5.00	4.50	1.315	1.19	170	1130
MRSS3S-010	3-Way Galvanized Steel	5.00	4.50	1.660	1.50	170	1130
MPSS4S-010	4-Way PVC Coated Steel	5.00	4.50	1.315	1.19	170	1200
MPSS3S-010	3-Way PVC Coated Steel	5.00	4.50	1.660	1.50	170	1200

Standard Multi-Gard supplied with grey and one white tracer innerduct.



Galvanized Steel Multi-Cell Fixed Bends With Spin Coupling

Multi-Gard fixed bends use the same coupling design as straight sections. All bends are provided with engineered plastic innerducts to avoid rope cut-through into adjacent innerducts.

Part No.	Description	Innerduct I.D.	Pkg. Qty.
MR_HN4S	4-Way Fixed Bends	1.19	1
MR_HN3S	3-Way Fixed Bends	1.50	1

Pos. 1 Product
M = Multi-Cell

Pos. 2 Outerduct
R = Galvanized Steel
P = PVC Coated Steel

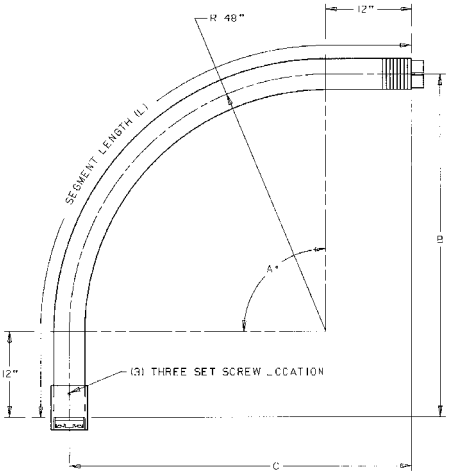
Pos. 3 Degree(A)
3 = 11¼°
5 = 22½°
7 = 45°
9 = 90°

Pos. 4 Radius(R)
H = 4 ft.
F = 3 ft.

Pos. 5 O.D.
N = 4"

Pos. 6 Innerducts
4 = 4-Way
3 = 3-Way

Pos. 7 Innerduct Wall Type
S = Smooth



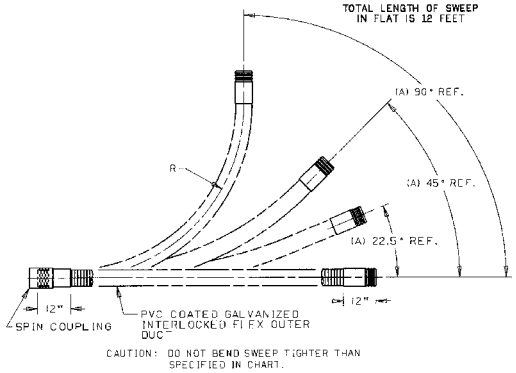
PART NUMBER	DIMENSIONS A	B	C	L
MR3HN__S	11.25°	60	60	2' 9"
MR5HN__S	22.5°	60	60	3'-7"
MR7HN__S	45°	60	60	5'-2"
MR9HN__S	90°	60	60	8'-3"

PRODUCT SHIPPED WITH CLOSED END THREAD PROTECTORS

PVC Coated Flexible Steel Bends With Spin Coupling

Multi-Gard flexible bends use a patented design capable of a 4' minimum bend radius and use the same coupling design as straight sections and fixed bends. All bends are provided with engineered plastic innerducts to avoid rope cut-through into adjacent innerducts. NOTE: After positioning the bend in its application, it is necessary to cut off the excess innerduct material flush to pipe and deburr both the I.D. and O.D. of the innerduct to remove snags.

Part No.	Description	Innerduct I.D.
MRFB4	4-Way Flexible Bend	1
MRFB3	3-Way Flexible Bend	1

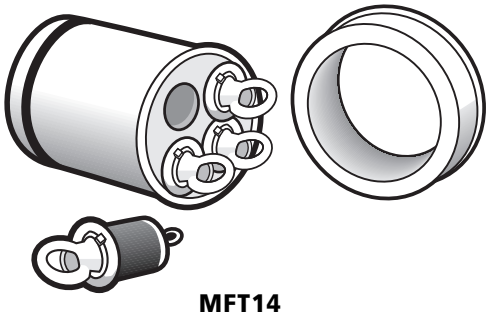


PART NUMBER	DIMENSIONS R	A
MRFB __	4 FT	0-90°
	6 FT	0-70°
	9 FT	0-55°

Terminators Galvanized Steel

Termination kits allow for sealing inner and outerducts. Each kit contains innerduct sealing plugs with rope tie. Standard terminators allow for end terminations.

Part No.	Description	Pkg. Qty.	Wt. Ea.
MFT14	4-Way Standard Terminator GS	1	1.5
MFT13	3-Way Standard Terminator GS	1	1.5



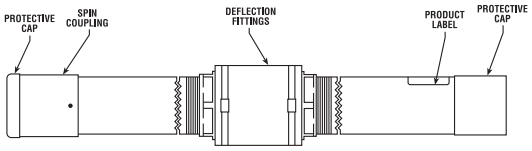
MFT14

Deflection Joint

Couplings are provided in standard sleeve for joining two uninstalled plain ends and slip couplings for repair of unoccupied Multi-Gard.

Part No.	Description	Pkg. Qty.	Wt. Ea.
MROS_	Deflection Joint	1	25 lbs.

Pos. 1 Product	Pos. 2 Outerduct	Pos. 3 Description	Pos. 4 Outerduct	Pos. 5 Innerduct
M = Multi-Cell	R = Galv. Steel	O = Offset/ Deflection	S = Standard	4 = 4-Way 3 = 3-Way



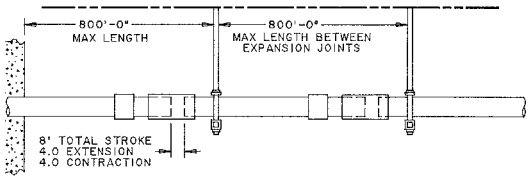
NOTE: PRODUCT DESIGNED FOR OUTDOOR WET LOCATIONS.
PRODUCT SHIPPED WITH CLOSED-END THREAD PROTECTORS.

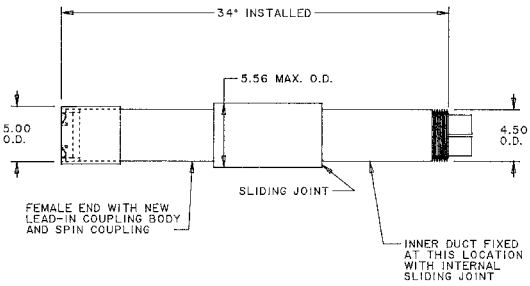
Expansion Joints

Expansion Joints allow for thermal expansion and contraction of outerduct. Steel expansion joints are recommended every 800 feet on bridge crossing applications.

* Expansion Joints are not required in underground applications

Part No.	Description	Pkg. Qty.	Wt. Ea.
MREC4	4-Way 8" Stroke	1	60
MREC3	3-Way 8" Stroke	1	42





Spare Spacers

Part No.	Description	Std. Ctn. Qty.	Std. Ctn. Wt.
MAES4	4-way end spacers	1 ea. = 5 spacers	3.5
MAES3	3-way end spacers	1 ea. = 5 spacers	.6

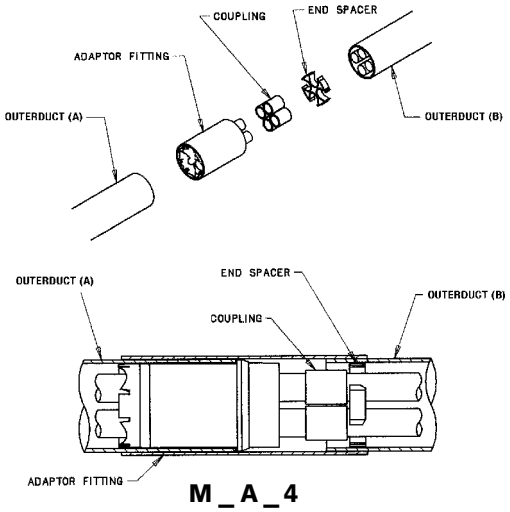
Transition Adapters

• Spigot to Spigot

Transition adaptors allow different outerducts to be coupled together while maintaining same innerduct.
Part numbers configured from smaller duct to larger duct.

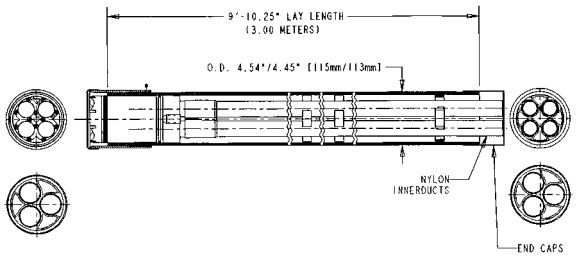
Part No.	Description	Pkg. Qty.
M_A__	Transition Adapter	1

Pos. 1 Product	Pos. 2 Outerduct (A)	Pos. 3 Description	Pos. 4 Outerduct (B)	Pos. 5 Innerducts
M = Multi-Cell	X = Type C PVC F = Type 40 PVC D = Type 80 PVC	A = Adapter	E = EMT R = Galv. Steel B = F/G BR H = F/G HW F = Type 40 PVC D = Type 80 PVC X = Type C PVC P = PVC Coated Steel	3 = 3-Way 4 = 4-Way



Field Bendable Sweeps

Part No.	Description	Pkg. Qty.
MRSS4SFB-010	4-Way Field Bendable Sweep - 10 ft.	1
MRSS3SFB-010	3-Way Field Bendable Sweep - 10 ft.	1



Prime Conduit™ Multi-Gard® EMT

Multi-Gard EMT is a multi-cell conduit system for use inside buildings. It has pre-installed PVC innerducts, comes in 10 ft. lengths, and has a gasketed coupling body.

Applications: **Indoor – Inside Buildings**
Innerducts: **3-Way 1 1/2" or 4-Way 1 1/4"**

Features

- 10' lengths with set screw couplings.
- Standard sweeps and terminators
- Transition adapters available such as EMT to Type C Multi-Gard.
- PVC innerducts lay straight for longer pulls.
- PVC innerducts are pre-lubricated for longer pulls.
- All metallic components are UL Listed and conform to NFPA 90A for installation of communication cables inside buildings.
- All bends have "cut through" resistant innerducts to avoid rope cutting into adjacent occupied innerduct.
- Accessories such as line blowing kits and pull line available.

Technical Information

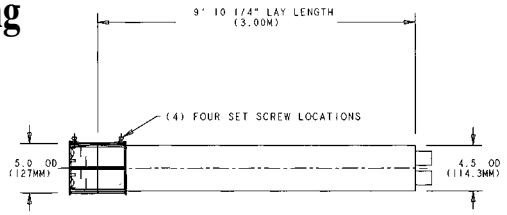
- Joint Tensile: Approx. 500 lbs. (for reference only)
- 3,500 ft. Maximum for Jetting
- 10 ft. lay lengths standard

Assembly Instructions

1. Remove cap and loosen set screws on open end of coupling.
2. Insert male end of conduit into female coupling, checking for alignment of marked innerduct into marked hole.
3. Tighten set screws.

10' Lay Length EMT Multi-Cell with Set Screw Coupling

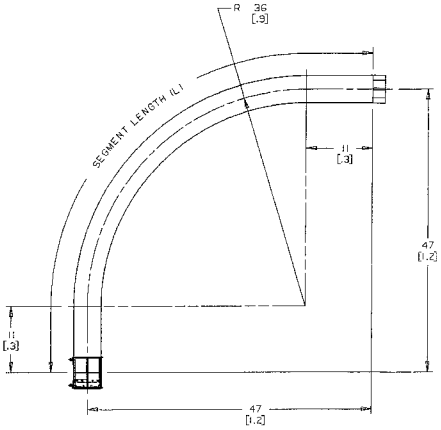
Part No.	Description	Outerduct Dim. O.D.	Outerduct Dim. I.D.	Innerduct Dim. O.D.	Innerduct Dim. I.D.	Pkg. Qty.	Wt. per 100 ft.
MESS4S-010	4-Way	4.50	4.33	1.32	1.19	170'	555
MESS3S-010	3-Way	4.50	4.33	1.66	1.50	170'	555



Fixed Bends EMT Multi-Cell with Set Screw Coupling

Multi-Gard fixed bends use the same coupling design as straight sections. All bends are provided with engineered plastic innerducts to avoid rope cut-through into adjacent innerducts.

Part No.	Description	Pkg. Qty.	Wt. Ea. (lbs.)
ME9FN4S	4-Way 90˚x36" Radius	1	39
ME7FN4S	4-Way 45˚x36" Radius	1	20
ME9FN3S	3-Way 90˚x36" Radius	1	39
ME7FN3S	3-Way 45˚x36" Radius	1	20

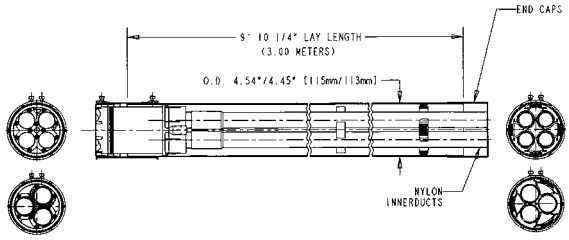


PART NUMBER	SEGMENT LENGTH (L) (INCHES / METERS)
ME7FN__S	50.30 (1.28)
ME9FN__S	78.50 (1.99)

Field Bendable Sweeps

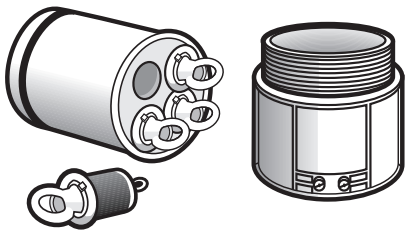
Multi-Gard flexible bends use a patented design capable of a 4' minimum bend radius and use the same coupling design as straight sections and fixed bends. All bends are provided with engineered plastic innerducts to avoid rope cut-through into adjacent innerducts. NOTE: After positioning the bend in its application, it is necessary to cut off the excess innerduct material flush to pipe and deburr both the I.D. and O.D. of the innerduct to remove snags.

Part No.	Description	Pkg. Qty.
MESS4SFB	4-Way EMT Field Bendable Sweep - 10 ft.	1
MESS3SFB-010	3-Way EMT Field Bendable Sweep - 10 ft.	1



Terminators for EMT Multi-Gard

Part No.	Description	Pkg. Qty.	Wt. Ea. (lbs.)
MET64	4-Way Standard Enclosure Terminator	1	2.5
MET63	3-Way Standard Enclosure Terminator	1	2.5



Spare Spacers

Part No.	Description	Std. Ctn. Qty.	Std. Ctn. Wt.
MAES4	4-way end spacers	1 ea. = 5 spacers	3.5
MAES3	3-way end spacers	1 ea. = 5 spacers	.6

Part 1 General

1.01 SCOPE: Multiple Celled raceway systems, such as Multi-Gard manufactured by Prime Conduit, utilizing prelubricated PVC innerducts for installation of voice, data, video, and other low voltage cabling. Different outershells are provided for routing cabling through direct bury, concrete encased, normal above ground, and heavy duty above ground applications.

1.02 SYSTEM DESCRIPTION: Industry standard communication outerducts and innerducts meeting the performance requirements of this specification. Fixed and flexible bends allow for changes in direction. A gasketed coupling mechanism shall be provided with self-aligning tapered holes in straight sections, bends, and terminators for field assembly without lubricant.

Part 2 Product

2.01 MATERIALS

A. Outerducts

1. PVC outerduct shall have print line stating "INSTALL PRINTLINE UP" and be available in the following:
- **a.** Type C U.L. listed for direct burial and concrete encasement.
- **b.** Type 40 U.L. listed for direct burial and concrete encasement.
- **c.** Type 80 for heavy traffic direct burial and physical abuse above ground.

2. Fiberglass reinforced epoxy shall be available in the following:
- **a.** .090 Heavy Wall provides enhanced mechanical protection where physical abuse might be experienced.
- **b.** .250 Bullet Resistant provides heavy duty protection.

3. Galvanized steel shall be available in the following:
- **a.** Type 40 Hot dipped inside and out for above ground applications such as bridge abutment walls. Threads shall be on both ends. Spin Coupling shall have 3 set screws set 120˚ apart to stabilize coupling. Threads shall be coated with Zinc Oxide metalizing.

4. U.L. listed EMT outershell and couplings for inside building applications including Risers and General Purpose areas.

B. Outerduct Performance Requirements

	PVC			Fiberglass		Steel	
	Type C	Type 40	Type 80	HW	BR	EMT	GRC
Min. stiffness lb/in/in at 72˚ F	100	370	Crush 2000	90	N/A	N/A	N/A
Min. O.D.	4.35"	4.50"	4.75"	4.18"	4.50"	4.50"	4.50"
Impact values ft/lbs. at 72˚ F	100	220	525	80	N/A	N/A	N/A
Max. joint insertion force	80 lbs.	80 lbs.	80 lbs.	80 lbs.	80 lbs.	80 lbs.	80 lbs.
Max. joint separation force	200 lbs.	200 lbs.	200 lbs.	200 lbs.	200 lbs.	Mechanical	Mechanical
Min. joint water infiltration	11 PSI	11 PSI	11 PSI	N/A	N/A	N/A	N/A
Min. lay length	20'	20'	20'	20'	20'	10'	10'
Flexible bend min. radius	4'	4'	4'	4'	4'	4'	4'

C. Innerducts

1. Innerducts in straight lengths shall be Prelubricated PVC. One white innerduct shall be under the print line with other innerducts being gray. Multi-Cell can be assembled from different directions without "mirror" effect. Multi-colored innerducts may also be provided.

2. Innerducts in all bends shall not cut through when subjected to a 1/4" polyprolene rope pulled at 100 ft/min at 450 lb. tension for 100 minutes tested in accordance with Bellcore TR-TSY-000356 procedures.

3. A non-cemented spacer system shall hold the 4-cell innerducts in a square configuration and 3-cell innerducts in a triangular configuration.

D. Innerduct Performance Requirements

	4-way	3-way
Min. stiffness lb/in/in at 122˚ F	170	140
Air burst pressure rating	200 PSI	200 PSI
COF requirements TSY-356	Pass .06 - .09	Pass .06 - .09
Cut-through testing TSY-356 (in bends)	Pass 100 min.	Pass 100 min.

2.03 BENDS AND ACCESSORIES

A. Bends

	PVC			Fiberglass		Steel	
	Type C	Type 40	Type 80	HW	BR	GRC	EMT
Fixed bend radius available	3', 4', 6', 9'	3', 4', 6', 9'	3', 4', 6', 9'	4'	4'	4'	3'
Flexible bend 10' 1/2" length	4' x 90°	4' x 90°	4' x 90°	Use GRC	Use GRC	4' x 90° (12')	Use GRC
Flexible bend 16' length	9' x 90°	9' x 90°	9' x 90°	Use GRC	Use GRC	4' x 90° (12')	Use GRC

B. Accessories

1. Slip couplings to allow male/male connections.
2. Termination kits for vaults, handholes, enclosures, pass-through and jet-through applications.
3. Repair kits for future repair of empty or occupied duct.
4. Drop kits for future dropping of empty or occupied duct.
5. Line blowing kits with missiles.
6. 1700 lb. Slick braid rope, 1130 lb. poly rope, twisted blow line, and 1250 lb. polyester woven tape.

Part 3 General

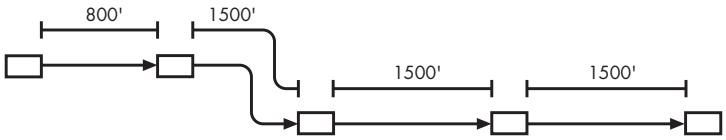
3.01 DELIVERY, STORAGE, HANDLING

A. All materials shall be furnished by same manufacturer.
B. Local personal field support shall be available.
C. Product application assistance shall be provided by manufacturer as needed.
D. All flexible bends must be shipped in protective shipping containers.
E. Manufacturer shall supply installation instructions.

Feature	Multi-Gard
Pre-lubricated PVC Innerducts	Yes
Assembles without lubricant	Yes
Type C, Type 40, Type 80	Yes
Fiberglass in .090, .250	Yes
EMT for Inside Building	Yes
Galvanized Steel with Reverse Spin Coupling/PVC Coated Galvanized	Yes
Flexible Sweeps capable of 4' bend radius	Yes
Engineering Assistance	Yes
Local Training and Assistance	Yes
20 Foot Lay Lengths	Yes
Local Stock	Yes
U.L. Listed	Yes (Type 40 & Type C only)
Recommended for Boring	Yes (Boreable Multi-Gard only)
Watertight	Yes
Holds 120 PSI for Jetting	Yes
No Solvent Cement Required (Except in Boring and Jetting Applications)	Yes
Pulling Planner for Pull Point location	Yes
Drawings on Disk	Yes

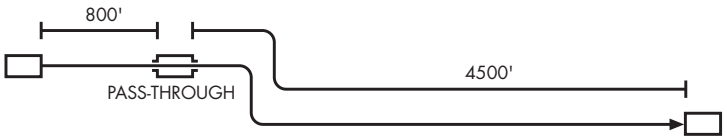
Multi-Gard® Gards Your Networks!

Multi-Gard Saves You Money! Multi-Gard® vs. Conduit and Pulled Innerduct Cost Comparison



Cost of Raceway and Pulling 3 x 1.25" Innerducts

Material	Qty.		Cost		Total	Labor	Cost		Total	
4" Conduit Type C	5,300'	_____	.75 per ft.	_____	3975	same for both				
90˚ x 48"	2	_____	15.00 each	_____	30	same for both				
Pull Boxes	5	_____	300.00 each	_____	1500	50.00 /ea.		_____	250	
Terminators	8	_____	25.00 each	_____	200	same for both				
Plugs	24	_____	2.00 each	_____	48	same for both				
Pulling Eyes	3	_____	60.00 each	_____	180	10.00 ea.		_____	30	
Pulling Harness	1	_____	60.00 each	_____	60	10.00 ea.		_____	10	
Innerduct	16,000	_____	.30 per ft.	_____	4800	16,000' x	.25 /ft.	_____	4000	
Lubricant	16,000	_____	.02 per ft.	_____	320	2.00 per 100 ft.		_____	320	
Cement	10 qt.	_____	4.00 qt.	_____	40	5,300 ÷20' = 265 x	.25 /ea.	_____	66	
Reel Disposal	3	_____	25.00 each	_____	75		10.00 /ea.	_____	30	
Mid. Assist. Equip.	2 x 8 hrs.	_____	100.00 hr.	_____	800	5,300 x _____	.10 /ft.	_____	530	
				_____	12028			_____	5236	**17264**



Cost of Multi-Gard with 3 x 1.5" Innerducts or 4 x 1.19" Innerducts Pre-installed

Material	Qty.		Cost		Total	Labor	Cost		Total	
Multi-Gard® Type C	5,300	_____	2.50 per ft.	_____	13250	same				
90 x 48"	2	_____	75.00 each	_____	150					
Pull Boxes	3	_____	300.00 each	_____	900		50 /ea.	_____	150	
Term. w/ Plugs	2	_____	35.00 each	_____	70	same				
Term. Pass Thru	4	_____	60.00 each	_____	240	same				
Pre-Lubricant			Included		N/C		-0-	_____	-0-	
Mid. Assist. Equip.			Not Required		N/C	5300 x _____	.10 /ft.	_____	530	
				_____	14610			_____	680	**15290**

Additional Benefits of Using Multi-Gard Raceway from Prime Conduit

1. Eliminates the need to place innerducts into an empty conduit. Multi-Gard contains factory installed innerducts.
2. Multi-Gard factory pre-installed PVC innerducts provide a straight path for the placement of cable.
3. Reduced installation cost. The cost of installing innerducts is eliminated and innerduct waste is eliminated.
4. Multi-Gard prelubrication formula provides the lowest coefficient of friction available.
5. The Multi-Gard gasketed coupler system eliminates cementing sections except when boring or jetting.
6. Multi-Gard patented fixed bends and flexible bends incorporate "cut-through" resistant innerducts. Pre-installed engineered plastic innerducts prevent pull lines from cutting into the innerduct sidewall when pulling around bends. Bends containing HDPE or PVC innerducts do not have the same resistance to cut-through.
7. Open the trench just once. Multi-Gard allows customers additional cells to upgrade their Telecom Network System.
8. Multi-Gard factory installed innerducts allow more innerducts to be placed inside the 4" conduit (4 x 1.19" and 3 x 1.50"). When placing innerducts you are limited to (3 x 1.25" or 2 x 1.5") on many systems.
9. Multi-Gard factory installed innerducts avoid the risk of "neckdown". Neck-down occurs when innerducts are pulled past their tensile strength, causing the plastic to stretch out.
10. All material arrives on the job site at the same time! Crews can begin assembly without waiting for additional material to deliver. After installing Multi-Gard there are no empty reels to return or dispose.

Multi-Gard® Multi-Cell Conduit System

A major telephone company sponsored a competition to compare and evaluate the two leading multi-cell conduit systems currently available in the communications industry.

Under the supervision of the telephone company, an independent contractor was hired to install the two multi-cell conduit systems meeting standard installation requirements. Additionally, a consultant was retained by the telephone company to monitor the test pulls and prepare a product evaluation for each multi-cell conduit system.

The following information was compiled from the consultant's report. Values stated were derived from actual field measurements or calculated from field measurements.

Prime Conduit's multi-cell conduit system, Multi-Gard®, offered smooth wall PVC innerducts with factory applied silicone lining. The competitor's multi-cell conduit system offered a longitudinal ribbed polyethylene, silicone lined innerduct product.

The installation layout selected for the trial consisted of a 4,900-foot section that included numerous horizontal and vertical directional changes, eight manholes, and a road bore. Additionally, record-breaking rainfall made the competition even more intense.

The cable selected for the trial consisted of a six pair, copper cable with a low density polyethylene jacket. This particular cable was selected because it is approximately the same weight and diameter as many fiber-optic cables. The low density polyethylene jacket placed the evaluation under the worst possible coefficient of friction conditions.

Prime Conduit's Multi-Gard system successfully completed the trial pull with the test cable. The competitor's system could not.

A 1/4" composite rope (braided polyethylene over braided polyester) was blown into the innerduct of Prime Conduit's Multi-Gard. The force required to pull the rope through the 4,900 feet was 27 pounds. This force was measured after the rope rested in the flooded innerduct for more than 10 hours.

The test cable required a maximum pull force of 440 pounds to complete the 4,900 feet trial. At 4,173 feet into the pull, the cable jacket yielded and the pull came to a stop. The basket grip was re-installed on the cable and only 267 pounds of force was required to start the cable moving.

Using the values measured and the tension forecasting software provided by the consultant, the coefficient of friction was calculated as follows:

Pull Rope	**.09**
Test Cable	**.18**
Cable B	**.13**

Just One More Example Of How You Can't Beat The System!